

REMARKS

Applicant thanks the Examiner for the very thorough consideration given the present application.

Claims 1, 4-8, 10 and 12-16 are now present in this application. Claims 1 and 6 are independent.

Claims 3 and 9 have been cancelled. Claims 1, 6 and 10 have been amended. Reconsideration of this application, as amended, is respectfully requested.

Reasons for Entry of Amendments

At the outset, it is respectfully requested that this Amendment be entered into the Official File in view of the fact that the amendments to the claims automatically place the application in condition for allowance.

In the alternative, if the Examiner does not agree that this application is in condition for allowance, it is respectfully requested that this Amendment be entered for the purpose of appeal. This Amendment reduces the issues on appeal. This Amendment was not presented at an earlier date in view of the fact that Applicant did not fully appreciate the Examiner's position until the Final Office Action was reviewed.

Rejection Under 35 U.S.C. 103

Claims 1, 3-9 and 12-14 are rejected under 35 U.S.C. 102(a) as being unpatentable over Japanese Patent Publication 09-106978 to Miyazaki, in view of Japanese Patent Publication 09-106987 to Takeda, and claim 10 stands rejected over Miyazaki in view of Takeda as applied to claims 1, 3-9 and 12-14, and further in view of Iwai. Further, claims 15 and 16 stand rejected over Miyazaki in view of Takeda, and further in view of Toshima. These rejections are respectfully traversed.

While not conceding to the appropriateness of the Examiner's rejection, the Applicant respectfully submits that claims 3 and 9 have been cancelled, thereby rendering the rejection thereof moot.

In the Examiner's Response to Arguments, paragraph [0018] is cited in support of the Examiner's assertion that storage room 6 is not exposed to air atmosphere, but rather, is exposed to atmospheric pressure. However paragraph [0018] also provides that after the wafers are exposed to atmosphere, they must undergo rinsing because of rapid corrosion occurring on the aluminum pattern because of the presence of Cl in the resist residue. Here, Miyazaki provides that the corrosion is due to the reaction of Cl with the moisture in the atmosphere.

Further, [Claim 2] of Miyazaki and also paragraph [0008] of Miyazaki describe this exposure as "being wide opened in air atmosphere" and paragraph [0012] describe the exposure as "air opening" of the substrate. Clearly, the

corrosion occurring on the patterned substrate is due to exposure to outside air or “air atmosphere” and not merely “atmospheric pressure”.

Further, independent claim 1 has been amended to recite a combination of elements in an etch/strip apparatus integrated with cleaning equipment, including an etching line for etching and rinsing a substrate prior to stripping and a transfer module for moving the substrate from the etching line to the stripping line with no exposure of the substrate to air atmosphere.

Similarly, independent claim 6 has been amended to recite a combination of elements in an integrated etch/strip/clean apparatus, including said stripping line being unified with said etching line through a transfer module, wherein said transfer module moves the substrate from said etching line to said stripping line while preventing the substrate from drying.

Herein, key features of the recited combination of elements including the Applicant’s claimed transfer module are highlighted and are summarized as follows:

- (1) the transfer module is an “actual module” (not merely a means);
- (2) the transfer “module” is the unifying connector between the etch line and the strip line;
- (3) the substrate is moved from the etching line to the stripping line via the transfer module;
- (4) the module performs the transfer while:
 - a. preventing the substrate from drying

b. preventing the substrate from exposure to air atmosphere

In view of the above, the Applicant respectfully submits that these features are not disclosed or fairly suggested by the prior art of record, including Miyazaki and Takeda.

It appears from Miyazaki, the wafer conveyance machine 5 forms the connectivity between etching chamber 4 and wafer interim storage room 6. Wafer interim storage room 6 contains carriers 7 on which substrates are loaded. Wafer interim storage room 6 is isolated from ashing room 8 by a diaphragm 9. When diaphragm 9 is opened, carrier 7 is moved upward from interim storage room 6 into ashing room 8 one slit at a time. Then the diaphragm 9 is closed, again isolating storage room 6 from ashing room 8.

Clearly then, conveyance machine 5 is not a module that provides connectivity between the etching chamber and the ashing chamber. Rather, conveyance machine 5 provides connectivity between the etching chamber and storage room 6. Therefore (2) and (3) above are not met by Miyazaki. Because the requisite connectivity is not met by Miyazaki, then neither can (1) and (4) above be met by Miyazaki. Nevertheless, Miyazaki does not disclose a feature of a transfer module preventing the substrate from drying.

The Examiner admits that Miyazaki fails to teach a rinsing operation occurring between the etching and stripping operation, and relies on Takeda to supply this deficiency. The Applicant respectfully submits, the even if the rinsing module of Takeda was included in the Miyazaki device, the features of the

Applicant's claims would still not be met. In other words, inserting a rinsing module between the etch module 4 and wafer conveyance machine 5 would still not provide the requisite connectivity. In other words, the etch module 4 would still be connected to the storage room 6 by the conveyance machine 5. Further, the drying preventing feature would still not be met.

Further, the etching and stripping lines of Takeda are connected by a heating chamber 42 (preceded by a drying chamber). Here, besides the requisite connectivity not being met, Takeda teaches away from preventing the substrate from drying. In view of the above, Takeda cannot supply the deficiencies of Miyazaki.

Therefore neither Miyazaki, nor Takeda, either singly, or in combination, teaches or suggests a combination of elements in an etch/strip apparatus integrated with cleaning equipment, including an etching line for etching and rinsing a substrate prior to stripping and a transfer module for moving the substrate from the etching line to the stripping line with no exposure of the substrate to air atmosphere, as recited in independent claim 1 (as amended), or a combination of elements in an integrated etch/strip/clean apparatus, including said stripping line being unified with said etching line through a transfer module, wherein said transfer module moves the substrate from said etching line to said stripping line while preventing the substrate from drying, as recited in independent claim 6 (as amended).

Claims 4-8, 10 and 12-16 depend, either directly or indirectly, on independent claims 1 and 6. Since neither Miyazaki, nor Takeda teaches or suggests the above-recited features of independent claims 1 and 6, Miyazaki, in view of Takeda, cannot render claims 1, 4- 8, 10 and 12-16 obvious to one of ordinary skill in the art. Reconsideration and withdrawal of these art grounds of rejection is respectfully requested.

Claims 1, 3-9 and 12-16 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,672,239 to DeOrnellas in view of U.S. Patent No. 6,007,675 to Toshima and claim 10 stands rejected over DeOrnellas in view of Toshima and further in view of Iwai. These rejections are respectfully traversed.

While not conceding to the appropriateness of the Examiner's rejection, the Applicant respectfully submits that claims 3 and 9 have been cancelled, thereby rendering the rejection thereof moot.

DeOrnellas, like Miyazaki, fails to teach or suggest the above-recited combinations.

First, DeOrnellas teaches that the strip module 24 is vented to atmosphere (DeOrnellas, Col. 3, lines 55-60). Generally, "vented to atmosphere" means vented to outside air, but conceivably (yet rare) venting to atmosphere can be accomplished by venting the chamber to a closed environment that is known to be at atmospheric pressure. Normally however, in an operation of venting, a closed environment is bled down to atmosphere (atmospheric pressure). Since

atmospheric pressure changes, venting to the outside is the only sure way of venting to atmosphere. DeOrnellas does not teach or suggest the rare exception.

Strip module 24 contains wafer A (and subsequently all of the wafers) and therefore the wafers are exposed to air atmosphere. Next, the wafer A undergoes a pre-strip rinse step and a spin-dry step in rinse module 25. Once rinsing and drying is completed, atmospheric robot arm 32 transfers the wafer from rinse module 25 back to strip module 24. Here, DeOrnellas teaches a drying step for the wafer as opposed to a feature of preventing the wafer from drying. Atmospheric robot arm 32 does not perform a function of preventing the wafer from drying. Therefore DeOrnellas fails to teach or suggest a combination of elements in an etch/strip apparatus integrated with cleaning equipment, including an etching line for etching and rinsing a substrate prior to stripping and a transfer module for moving the substrate from the etching line to the stripping line with no exposure of the substrate to air atmosphere, as recited in independent claim 1 (as amended) or a combination of elements in an integrated etch/strip/clean apparatus, including said stripping line being unified with said etching line through a transfer module, wherein said transfer module moves the substrate from said etching line to said stripping line while preventing the substrate from drying, as recited in independent claim 6 (as amended). Neither Toshima, nor Iwai can supply the deficiencies of DeOrnellas.

Claims 4-8, 10 and 12-16 depend, either directly or indirectly on independent claims 1 and 6. Since neither DeOrnellas, nor Toshima, nor Iwai teaches or suggests the above-recited features on independent claims 1 and 6, DeOrnellas, Toshima and Iwai, either singly or in combination cannot render claims 1, 4-8, 10 and 12-16 obvious to one of ordinary skill in the art. Reconsideration and withdrawal of these art grounds of rejection is respectfully requested.

Conclusion

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance.

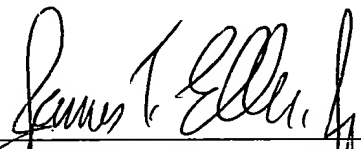
If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone Percy L. Square, Registration No. 51,084, at (703) 205-8034, in the Washington, D.C. area.

Prompt and favorable consideration of this Amendment is respectfully requested.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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